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Cultural Resources Investigations for the CPS Energy Broadway-Jones Avenue Gas Main Replacement Project, Bexar County, Texas

Chris Matthews

Rhiana Ward

Cultural Resources Investigations for the CPS Energy Broadway-Jones Avenue Gas Main Replacement Project, Bexar County, Texas

CULTURAL RESOURCES INVESTIGATIONS FOR THE CPS ENERGY BROADWAY-JONES AVENUE GAS MAIN REPLACEMENT PROJECT, BEXAR COUNTY, TEXAS

FINAL REPORT (Redacted)

Prepared for:
CPS Energy
145 Navarro Street
San Antonio, Texas 78205

Prepared by:
Chris Matthews and Rhiana Ward

RABA KISTNER ENVIRONMENTAL
RABA-KISTNER ENVIRONMENTAL, INC.
12821 West Golden Lane
San Antonio, Texas 78254

Principal Investigator
Rhiana D. Ward, M.A.

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MANAGEMENT SUMMARY

Raba Kistner Environmental, Inc. (RKEI), was contracted by CPS Energy (CPSE) to conduct cultural resources investigations for the CPSE Broadway-Jones Gas Main Replacement Project in northeastern San Antonio, Bexar County, Texas. The project involved the excavation of a 630 foot (192 meter [m]) trench for the relocation of a gas main within the 10th Street and Avenue B right-of-ways (ROWs). A cultural resources review conducted by the CPSE Archaeologist determined that the project had the potential to encounter a possible *desague*, or lateral, of the *Acequia Madre*. Furthermore, close proximity to the San Antonio River, located 150 feet (46 m) to the northwest, increased the probability of encountering prehistoric cultural deposits. Based on this information, the CPSE Archaeologist determined that cultural resources monitoring would be required for all 630 feet (192 m) of excavations associated with the project.

Given that the project took place within a publicly owned ROW and because CPSE is a political subdivision of the State of Texas, the project was subject to review under the jurisdiction of Chapter 35 of the Unified Development Code (UDC) of the City of San Antonio (COSA), as well as the Antiquities Code of Texas (ACT). Rhiana D. Ward served as Principal Investigator and Project Manager for the duration of the project, and all field work was conducted by Project Archaeologist Chris Matthews.

Cultural resources monitoring investigations for the Broadway-Jones Gas Main Replacement Project were conducted on February 7-8, 19-23, and 25, 2019. Disturbed soils were observed throughout most of the 10th Street ROW, as well as a majority of the Avenue B ROW. However, two features were recorded at the northeastern end of the APE, within the Avenue B ROW. No intact deposits of cultural deposits were observed.

Feature 1, recorded as archaeological site 41BX2308, is a limestone feature, approximately 286 feet (87 m) northeast of the 10th Street – Avenue B intersection. A restricted 1852 overlay map provided by the COSA Office of Historic Preservation depicts a possible lateral of the *Acequia Madre* as intersecting the APE, approximately 20 feet (6 m) southwest of Feature 1. It is possible that Feature 1 represents the remnants of the *desague*, however, the small section of exposed alignment does not provide enough supporting evidence to definitively associate the feature to the projected lateral ditch. Furthermore, although the limestone material and rough cut construction of the stones suggests an early construction, no cultural

materials were observed that would support a temporal age range for the feature. Additional work may be warranted for any future ground disturbing activities anticipated within the vicinity of site 41BX2308 in order to determine the horizontal extent of the feature, and to provide additional information as to the function and temporal affiliation of the site. Based on the current investigations, **RKEI** recommends site 41BX2308 as eligibility undetermined for designation to the National Register of Historic Places (NRHP) or as a State Antiquities Landmark (SAL).

Feature 2, recorded as archaeological site 41BX2309, likely represents a remnant of the 1887 Texas Transportation Company Railroad rail bed. The feature consisted of two metal I-beam rails set on top of an aggregate concrete slab and capped with a separate layer of angular aggregate that likely represents the dismantling of the Texas Transportation Company Railroad in the early 2000s. No further work is recommended for site 41BX2309, and **RKEI** recommends the site as not eligible for designation to the NRHP or as a SAL.

RKEI made a reasonable and good faith effort to identify cultural resources within the given APE. As such, **RKEI** recommends no further archaeological investigations for the current APE. However, should additions be made to the APE, additional cultural resources investigations may be required. The project adhered to a temporally diagnostic artifact collection only policy. No artifacts were collected during the course of the investigations, thus, no artifacts will be curated at the completion of the project. All field records generated by this project will be permanently curated at the Center for Archaeological Research at the University of Texas at San Antonio.

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CHAPTER 1. INTRODUCTION

Raba Kistner Environmental, Inc. (RKEI), was contracted by CPS Energy (CLIENT) to conduct cultural resources monitoring investigations for the CPS Energy (CPSE) Broadway-Jones Gas Main Replacement Project in northeastern downtown San Antonio, Bexar County, Texas (**Figure 1-1**). The project was conducted under CPSE Work Order Number 40223030 and consisted of 630 feet (192 meters [m]) of underground trenching for the relocation of a gas main within the 10th Street and Avenue B right-of-ways (ROWs). This report summarizes the results of the investigations.

Given that the project took place within a publicly owned ROW and because CPSE is a political subdivision of the State of Texas, the project was subject to review under the jurisdiction of Chapter 35 of the Unified Development Code (UDC) of the City of San Antonio (COSA) (Article VI, Historic Preservation and Urban Design, COSA UDC), as well as the Antiquities Code of Texas (ACT) (Texas Natural Resources Code, Title 9, Chapter 191). These legislations call for the assessment of all improvement activities that have a potential to disturb historically significant resources and significant subsurface deposits on lands owned by the State. Oversight of compliance with the UDC is provided by the COSA Office of Historic Preservation (OHP), while the ACT is administered by the Texas Historical Commission (THC).

Area of Potential Effects

The Area of Potential Effects (APE) consisted of 630 feet (192 m) of trench alignment within the 10th Street and Avenue B ROWs. Trenching excavation began at the Broadway Street – 10th Street intersection and directed northwest for approximately 180 feet (55 m) before redirecting to the northeast and projecting down the Avenue B ROW for the remaining 450 feet (137 m). The alignment terminated at its intersection with the Jones Avenue ROW (**Figure 1-2**). Excavations ranged from 14 to 16 inches (36 to 41 centimeters [cm]) wide, and ranged from 45 to 47 inches (114 to 119 cm) below surface.

A cultural resources review conducted by the CPSE Archaeologist determined that the APE was located within a culturally rich setting that had the potential to encounter both historic and prehistoric cultural resources. Specifically, the project had the potential to encounter a possible *desague*, or lateral, of the *Acequia Madre*. Furthermore, close proximity to the San Antonio River increased the projects probably of encountering prehistoric cultural deposits. Based on this information, the CPSE Archaeologist requested that cultural resources monitoring be conducted for the entire 630 foot (192 m) APE.

Figure 1-1. Project Area location in northeastern downtown San Antonio, Bexar County, Texas.

Figure 1-2. Overview of the APE.

CHAPTER 2. ENVIRONMENTAL SETTING

The APE is located in the south-central Texas geographic region within the Blackland Prairie ecoregion. The Blackland Prairie is an area of low topographic relief and poor drainage, prone to frequent flooding (Collins 1995). The Blackland Prairie physiographic region is characterized by gently undulating topography and is generally defined as grasslands punctuated by riparian bands along creeks, rivers, and other drainages. Creation of the Blackland Prairie occurred during the late Tertiary, with the erosion of soils on the Edwards Plateau. These soils were deposited by eolian and colluvial processes across an existing, eroded parent material of the Gulf Coastal Plain, creating a mix of deep Tertiary and Quaternary calcareous clay soils (Black 1989). The project area is situated 150 feet (46 m) southeast of the channelized San Antonio River, and is located on the *San Antonio East (2998-133)* 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle map.

Geology

The underlying geology of the APE is mapped as 100-percent Terrace deposits (Qt) of Holocene age (Barnes 1983). Terrace deposits are composed of varying proportions of sand, silt, clay, and gravel that may be locally indurated in terraces along streams. Gravel is more predominant in older, higher terrace deposits.

Soils

Soils within the project area are mapped as Tinn and Frio Soils with 0 to 1 percent slopes, frequently flooded (National Resources Conservation Service 2019) (**Figure 2-1**). Tinn and Frio soils are very deep (80 inches [203 cm]), moderately to well drained, moderately to very slowly permeable silty clays, silty clay loams, and clay loams that formed in calcareous clayey and loamy alluvium. They are found on flood plains.

Figure 2-1. Soils mapped within the APE.

Flora and Fauna

The project area is located near the intersection of the Balconian and Taumaulipan biotic provinces (Blair 1950). A diverse number of both floral and faunal resources are available from the Austroriparian, Taumaulipan, Chihuahuan, Kansan, Balconian and Texan biotic provinces.

There are three major geographic regions nearby the project area: the Edwards Plateau, the Blackland Prairie, and the South Texas Plains. Trees, plants and grasses in this region include cedar (*Juniperus ashei*), live oak (*Quercus fusiformis*), Texas mountain laurel (*Sophora secundiflora*), mesquite (*Prosopis glandulosa*), prickly pear (*Optunia* sp.), agarita (*Berberis trifoliolata*), cat claw (*Smilax bona-nox*), mustang grape (*Vitis mustangensis*), sotol (*Dasylirion texanum*), and Spanish dagger (*Yucca* sp.).

The fauna that inhabit the South-Central Texas region includes at least 95 bird and 29 mammal species. The area also contains a wide array of reptiles, fish and amphibians. Mammal species that were noted along the ROW include white-tailed deer (*Odocoileus virginianus*), nine-banded armadillo (*Dasypus novemcinctus*), Virginia opossum (*Didelphis virgininana*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), and cottontail rabbit (*Sylvilagus audubonii*).

South Texas Climate

The climate in south-central Texas is humid subtropical with hot and humid summers. From May through September, hot weather dominates with the cool season beginning around the first of November and extending through March. Winters are typically short and mild with little precipitation. San Antonio averages only 33 inches (84 cm) of rain per year (Southern Regional Climate Center 2019; based on monthly averages from 1980 to 2010). Monthly temperature averages range between 52°F in January to 85°F in August.

CHAPTER 3. CULTURAL CONTEXT

The cultural history of Bexar County and the vicinity spans approximately 11,500 years. Archaeologists have divided the occupation of the region into four principal periods and several sub-periods: Paleoindian, Archaic, Late Prehistoric, and Historic. The periods are characterized by changes in climatic conditions, distinct vegetation types and structure, and concomitant adaptive changes by human populations in hunting and gathering technologies and strategies, general material culture, and at the tail end of the cultural sequence, the arrival of non-indigenous populations. The standard summaries of the culture chronologies of Central Texas accepted by many of the regional archaeologists were produced by Collins (1995) and Prewitt (1981). Below is a brief summary of the cultural sequence that has been reconstructed by archaeologists for the south-central part of the State.

Paleoindian Period

The oldest cultural materials found in the region date to the Paleoindian period. The period spans roughly from 11,500–8800 B.P. (Collins 1995, 2004). The Aubrey site in Denton County has one of the earliest occupations, with radiocarbon assays dating to between 11,542 ± 11 B.P. and 11,590 ± 93 B.P. (Bousman et al. 2004:48). Paleoclimatic proxy measures suggest that a cooler climate with increased precipitation was predominant during the Late Pleistocene (Mauldin and Nickels 2001; Toomey et al. 1993), the later portion of the period.

Initial reconstructions of Paleoindian adaptations typically viewed these hunter-gatherers as traversing extreme distances in pursuit of now extinct mega-fauna such as mammoth and mastodon. While these Paleoindian populations did exploit the Late Pleistocene mega-fauna when it was accessible, a number of faunal assemblages from a larger number of sites indicate that the Paleoindian diet was more varied and consisted of a wide range of resources, including small game and plants. The Lewisville (Winkler 1982) and Aubrey sites (Ferring 2001) produced faunal assemblages that represented a wide range of taxa, including large, medium, and small species. Information on the consumption of plant resources during the Paleoindian period is lacking. Bousman et al. (2004) reported that the late Paleoindian component at the Wilson-Leonard site reflected the exploitation of riparian, forest, and grassland species. Analysis of Paleoindian skeletal remains indicates that the diets of the Paleoindian and later Archaic hunter-gatherers may have been similar (Bousman et al. 2004; Powell and Steele 1994).

The early portion of the Paleoindian period was characterized by the appearance of Clovis and Folsom fluted projectile points that were used for hunting mega-fauna. Typical projectile points produced at sites with occupations dating to the later portion of the Paleoindian period included the Plainview, Dalton, Angostura, Golandrina, Meserve, and Scottsbluff types. Meltzer and Bever (1995) have identified 406 Clovis sites in Texas. One of the earliest, 41RB1, yielded radiocarbon assays that put the maximum age for the Paleoindian component at 11,415 ± 125 B.P. (Bousman et al. 2004:47).

Sites in Bexar County that contain Paleoindian components include St. Mary's Hall (Hester 1978, 1990), Pavo Real (Collins et al. 2003), the Richard Beene site (Thoms et al. 1996; Thoms and Mandel 2006) and 41BX1396 (Tomka 2012). St. Mary's Hall, 41BX229, was first encountered in 1972 during the construction of a house just outside the school's property. The Pavo Real site, 41BX52, is located along Leon Creek in northwest Bexar County. The site was first documented in 1970 and has been investigated several times over the past 40 years (Collins et al. 2003). The Richard Beene site, 41BX831, is located along the Medina River in southern Bexar County (Thoms et al. 1996). Site 41BX1396 is located in Brackenridge Park in San Antonio, and was encountered during installations for lighting in 2010. Dating of organic samples indicated that occupation at the site occurred as early as 10,490–10,230 B.P.

Archaic Period

The Archaic period dates between ca. 8800 to 1200 B.P. It is divided into three subperiods: Early, Middle, and Late. During the Archaic, mobility strategies may have shifted to more frequent short distance movements that allowed the exploitation of seasonal resource patches. The intermittent presence of bison in parts of Texas, combined with changes is climatic conditions and the primary productivity of the plant resources may have contributed to shifts in subsistence strategies and associated technological repertoire. When bison was not present in the region, hunting strategies focused on medium to small game along with continued foraging for plant resources. When bison was available, hunter-gatherers targeted the larger-bodied prey on a regular basis.

Early Archaic

The Early Archaic spans from 8800 to 6000 B.P. (Collins 1995). Projectile point styles characteristic of the Early Archaic include Angostura, Early Split Stem, Martindale, and Uvalde (Collins 1995). The Early Archaic climate was drier than the Paleoindian period and witnessed a return to grasslands (Bousman et al. 1998). Mega-fauna of the Paleoindian period could not survive the new climate and ecosystems, therefore eventually dying out. Early Archaic exploitation of medium to small fauna intensified.

The Wilson-Leonard excavation produced a wealth of cultural materials representative of a lengthy period in regional prehistory. The projectile point assemblages from the site indicate that the lanceolate Paleoindian point forms continue from the Paleoindian into the Early Archaic (Angostura). However, relatively quickly during the Early Archaic, they are replaced by corner- and basally-notched and shouldered forms (Early Triangular, Andice, Bell) that quickly become the dominant points tipping the atlatl-thrown darts. In addition, the uses of small to medium hearths similar to the previous period were noted too. The appearance of earth ovens suggests another shift in subsistence strategies. The earth ovens encountered at the Wilson-Leonard site were used to cook wild hyacinth along with aquatic and terrestrial resources (Collins et al. 1998). Analyses of Early Archaic human remains encountered in Kerr County (Bement 1991) reveal diets low in carbohydrates in comparison to the Early Archaic populations found in the Lower Pecos region. Within Bexar County, the excavations at 41BX1396 revealed an Early Archaic component, radiocarbon dated to Cal B.P. 8390 to 8180 (Tomka 2012).

Middle Archaic

The Middle Archaic sub-period spans from 6000 to 4000 B.P. (Collins 1995; Weir 1976). Archaeological data indicates that there appeared to be a population increase during this time. Climate was gradually drying leading to the onset of a long drought period. Changes to the demographics and cultural characteristics were likely in response to the warmer and more arid conditions. Projectile point styles characteristic of this sub-period include Bell, Andice, Calf Creek, Taylor, Nolan, and Travis.

Subsistence during the Middle Archaic saw an increased reliance on nuts and other products of riverine environments (Black 1989). The increase of burned rock middens during the Middle Archaic represented the increased focus on the use of plant resources (Black 1989; Johnson and Goode 1994). Little is known about burial practices during the Middle Archaic. An excavation in an Uvalde County sinkhole (41UV4)

contained 25-50 individuals (Johnson and Goode 1994:28).

Late Archaic

The Late Archaic spans from 4000 to 1200 B.P. (Collins 1995, 2004). It is represented by the Bulverde, Pedernales, Kinney, Lange, Marshall, Williams, Marcos, Montell, Castroville, Ensor, Frio, Fairland, and Darl projectile points. The early part of the Late Archaic exhibited fluctuations in the temperature and rainfall. There appears to have been an increase in population at this time (Nickels et al. 1998).

Some researchers believe that the use of burned rock middens decreased during the Late Archaic. Some research has challenged this notion (Black and Creel 1997; Mauldin et al. 2003). Johnson and Goode (1994) discuss the role of burned rock middens in relation to acorn processing.

Human remains from burials related to the Late Archaic in Central and South Texas suggest the region saw an increase in population. This increase may have prompted the establishment of territorial boundaries which resulted in boundary disputes (Story 1985). Human remains dating to this sub-period have been encountered near the Edwards Plateau.

Late Prehistoric Period

The Late Prehistoric Period begins ca. 1,200 B.P. (Collins 1995, 2004), and appears to continue until the beginning of the Protohistoric Period (ca. A.D. 1700). The term Late Prehistoric is used in Central and South Texas to designate the time following the end of the Archaic Period. A series of traits characterizes the shift from the Archaic to the Late Prehistoric Period. The main technological changes were the shift to the bow and arrow and the introduction of pottery. The Late Prehistoric Period is divided into two phases: The Austin phase and the Toyah phase.

At the beginning of this period, environmental conditions were deemed to be warm and dry. Moister conditions appear after 1,000 B.P. (Mauldin and Nickels 2001). Subsistence practices appeared similar to the Late Archaic. Projectile points associated with the Austin phase include the Scallorn and Edwards types. The Toyah phase is characterized by the prominence of the Perdiz point (Collins 1995).

Most researchers concur that the early portion of the Late Prehistoric period saw a decrease in population density (Black 1989:32). Radiocarbon dates from some sites have indicated that the middens were utilized during the Late Prehistoric. Some archaeologists feel the peak of midden use was after A.D. 1 and into the Late Prehistoric (Black and Creel 1997:273). Radiocarbon dates from Camp Bowie middens provide evidence that supports Black and Creel's arguments that burned rock middens were a primarily Late Prehistoric occurrence (Mauldin et al. 2003).

Beginning rather abruptly at about 650 B.P., a shift in technology occurred. This shift is characterized by the introduction of blade technology, the first ceramics in Central Texas (bone-tempered plainwares), the appearance of Perdiz arrow points, and alternately beveled bifaces (Black 1989:32; Huebner 1991:346). Prewitt (1981) suggests this technology originated in north-central Texas. Patterson (1988), however, notes that the Perdiz point was first seen in southeast Texas by about 1350 B.P., and was introduced to west Texas some 600 to 700 years later.

Early ceramics in Central Texas (ca. A.D. 1250 to 1300) are associated with the Toyah phase of the Late Prehistoric and are referred to as Leon Plain ware. The Leon Plain ceramic types are undecorated, bone-tempered bowls, jars, and ollas with oxidized, burnished and floated exterior surfaces (Ricklis 1995). There is notable variation within the type (Black 1986; Johnson 1994; Kalter et al. 2005). This variation can be attributed to differences in manufacturing techniques and cultural affiliation. Analysis of residues on ceramic sherds suggests that vessels were used to process bison bone grease/fat, mesquite bean/bison bone grease and deer/bison bone grease (Quigg et al. 1993).

The return of bison to South and Central Texas during the Late Prehistoric resulted from a drier climate in the plains located to the north of Texas and increased grasses in the Cross-Timbers and Post Oak Savannah in north-central Texas (Huebner 1991). The increased grasses in the two biotas formed the "bison corridor" along the eastern edge of the Edwards Plateau and into the South Texas Plain (Huebner 1991:354-355). Rock shelter sites, such as Scorpion Cave in Medina County (Highley et al. 1978) and Classen Rock Shelter in northern Bexar County (Fox and Fox 1967), have indicated a shift in settlement strategies (Skinner 1981). Burials encountered that dated to this period often reveal evidence of conflict (Black 1989:32).

Historic Period

The beginnings of San Antonio came about with the establishment of Mission San Antonio de Valero in 1718. Fray Antonio de San Buenaventura y Olivares briefly visited the site several years prior, and petitioned to set up a mission at the headwaters of the San Antonio River to act as a waypoint in the journey to East Texas. The Marques de Valero, Viceroy of New Spain, granted Olivares' request (de la Teja 1995). The mission, presidio, and villa were first established on the San Pedro Creek, the "first spring" of the San Antonio River. Mission Valero occupied at least one other location on the east side of the San Antonio River before it was moved in 1724 to its final location.

Four days after Mission Valero was founded, Presidio de Bexar was established on May 5, 1718. The presidio was to house the Spanish soldiers who had come along with the expedition to found the Mission. Typically, the families that followed the soldiers lived just outside the presidio.

Two years later, in 1720, Mission San José y San Miguel de Aguayo was established on the opposite bank of the San Antonio River, and to the south of Mission Valero and Presidio San Antonio de Bexar. This mission was established to help serve native groups that did not want to reside at Mission Valero because they were not on friendly terms with groups already living there. The original location of Mission San José was along the east bank of the San Antonio River, approximately three leagues from Mission Valero. The mission was then moved to the opposite bank sometime between 1724 and 1729, and relocated to its present site during the 1740s due to an epidemic (Scurlock et al. 1976:222).

In 1722, just two years after Mission San José was founded, Mission San Francisco Xavier de Nàjera was established. The mission was to serve a group of 50 Ervipiami families that came from the Brazos River area (Schuetz 1968:11). Mission San Francisco Xavier de Nàjera was located on or near the present site of Mission Concepción. The mission was unsuccessful due to a lack of funding. An attempt was made to make the mission a sub-mission of Valero, but this failed as well (Habig 1968:78-81). Its doors closed in 1726 (Schuetz 1968:11). Ivey (1984:13) argued that the closure of the mission was due to the natives' lack of interest in entering mission life.

Within the next few years, three other missions were established within the San Antonio area. The remaining three missions were established in San Antonio within weeks of each other in 1731. These three

missions, Mission Nuestra Señora de la Purisima Concepción, Mission San Juan de Capistrano, and Mission San Francisco de la Espada, were originally missions established in east Texas. When each failed along the eastern border, they were moved to San Antonio.

In 1731, in addition to the five missions, Villa San Fernando de Bexar was established by the Canary Islanders. Prior to the establishment of Villa San Fernando, Villa de Bexar had been settled by 30 presidio soldiers, seven of whom were married and brought their families. Archival research indicates that upon arrival, the Canary Islanders immediately took over the land surrounding the garrison. This land was used as pasture and was originally property of Mission Valero. There had been a lack of cleared agricultural land at the time, leading Captain Juan Antonio Pérez de Almazán to allow the Canary Islanders use of the property (de la Teja 1995). The initial plan was for additional Canary Island settlers to be sent to San Antonio after the first group was established. Due to high costs to the Spanish Crown, no more groups were brought to Texas. The Canary Islanders launched a formal complaint against Mission Valero. In 1731, the Canary Islanders established their own villa, named San Fernando de Bexar, with their own church. The arrival of the Isleños resulted in the first clearly defined civilian settlement in San Antonio.

With the establishment of the San Antonio Missions, the Spanish constructed a system of acequias (irrigation ditches) utilizing local springs, streams, and the San Antonio River to supply water for the agricultural fields of the missions, personal use, and house hold purposes (Cox 2005; Porter 2009). The first acequias were simple, soil-lined, gravity-flow canals whose depressions can still be seen today in certain areas around central San Antonio (Cox et al. 1999). This system allowed the Spanish to sustain the large population of the Native Americans, settlers, and soldiers that occupied the area.

Previous Archaeological Investigations

A cultural resources desktop review was conducted in order to summarize all known cultural resources and surveys within a 1,000-foot (305-m) radius of the APE (THC 2019). The review identified seven known archaeological sites, two Official Texas Historical Markers (OTHMs), two National Register (NR) Historic Districts, and one National Register of Historic Places (NRHP) property (**Table 3-1, Figure 3-1**). Further review also determined that the APE lies within the boundaries of two previously conducted cultural resources investigations, and immediately adjacent to a third.

The APE is located within the boundaries of the 1979 *Survey of Archaeological, Architectural, and Historical Sites on the San Antonio River from Olmos Dam to South Alamo Street* study, conducted by the Center for Archaeological Research at the University of Texas at San Antonio (CAR UTSA) (Fox 1979). It is unlikely, however, that any subsurface investigations were conducted within the APE during the course of the survey (Fox 1979).

In 2018, SWCA Environmental Consultants conducted cultural resources investigations on behalf of CPSE for the Jones Avenue Pole Replacement Project (Ward 2015). Investigations consisted of cultural resources monitoring for the installation of 26 out of 100 overhead utility poles within five Monitoring Areas within downtown San Antonio. No significant cultural materials or features were documented during monitoring investigations (Ward 2015).

In 2018, Horizon Environmental Services, Inc., conducted archaeological investigations within the 3.3-acre Broadway Jones Tract immediately adjacent to the APE (Owens and St. Clair 2018). Backhoe trenching investigations identified one known archaeological site, 41BX2244 (Owens and St. Clair 2018, THC 2019).

Table 3-1. Known Cultural Resources within 1,000 feet (305 m) of the APE

Resources	Distance/Direction from Project Area	Brief Resource Description	Eligibility Determination
41BX1817	230 feet northwest	Alamo Mills Dam, cut limestone construction constructed circa 1872.	Undetermined (2010)
41BX1913	702 feet west	Arden Grove Site. Prehistoric buried lithic scatter consisting of biface thinning flakes, rabdotus shells, and a few small fire-cracked rocks.	No determination listed.
41BX2072	561 feet southwest	Alamo Mills Raceway. Ditch that diverted water from the Alamo Mills Dam (41BX1817).	No determination listed.
41BX2129	851 feet southeast	Two sections of iron rail bed likely associated with late 1800s street car facility.	No determination listed.
41BX2161	950 feet northwest	Multiple component site with unknown prehistoric scatter and late-nineteenth to mid-twentieth century historic artifacts and structural remains	No determination listed.
41BX2244	268 feet east	No further information available on Atlas.	Ineligible (2018)
41BX2250	961 feet south-southwest	No further information available on Atlas.	No determination listed.
OTHM	150 feet west	Petty House. Marker No. 18597, dedicated in 2017.	-
OTHM	630 feet southeast	Southwestern Bell Company. Marker No. 18387, dedicated in 2015.	-
NR Historic District	150 feet south	Poe Motor Company NR Historic District, listed in 2018.	-
NR Historic District	280 feet northwest	Old Lone Start Brewery NR Historic District, listed 1979.	-
NRHP	647 feet northwest	Old Lone Star Brewery. Listed on NRHP in 1972.	-

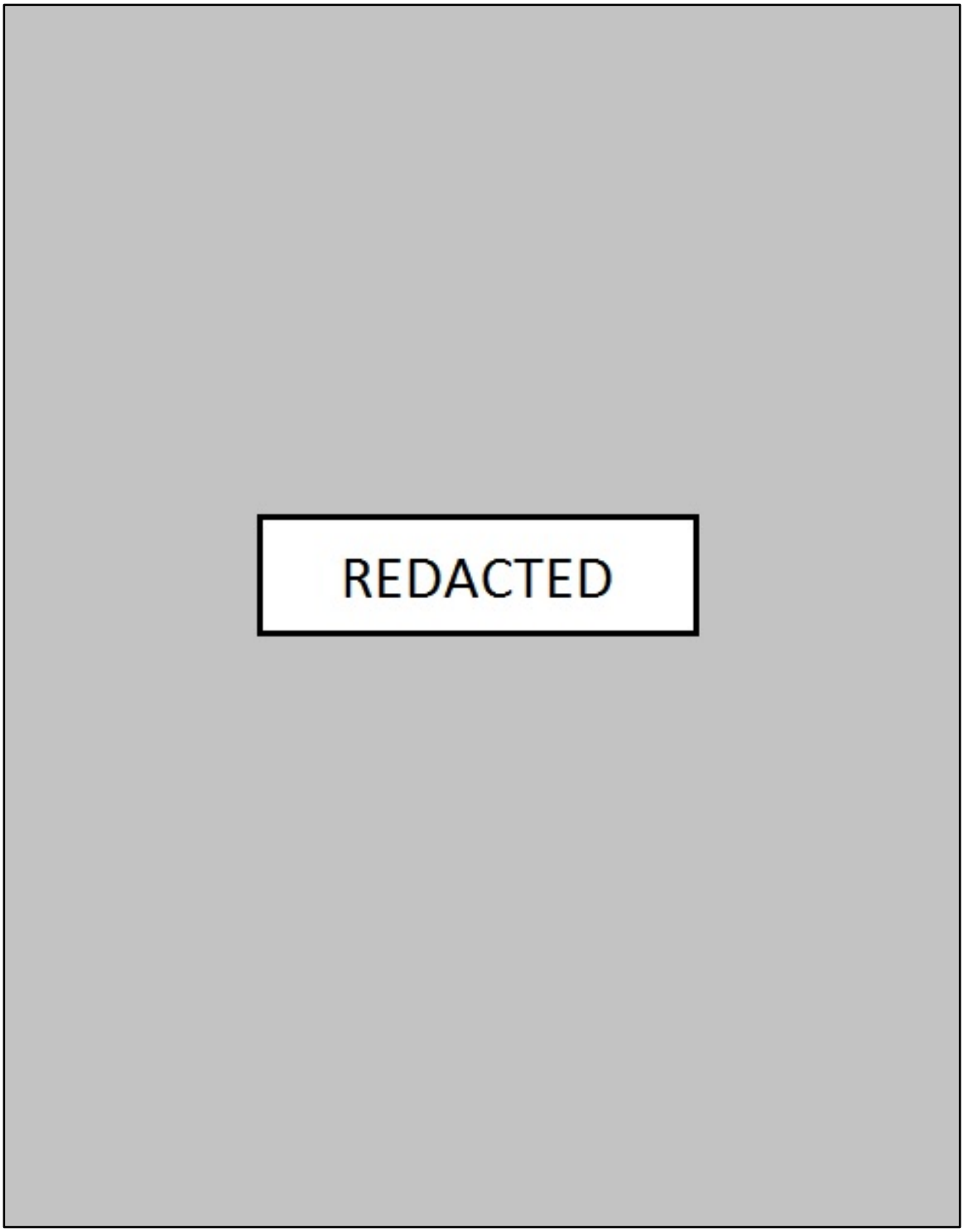

Figure 3-1. Known cultural resources and previous investigations within a 1,000 foot (305 m) radius of the project area.

CHAPTER 4. METHODS OF INVESTIGATION

To ensure that construction did not impact significant archaeological resources, **RKEI** archaeologists conducted archaeological monitoring of all ground disturbing activities within the 630-foot (192 m) APE. All work complied with THC and Council of Texas Archeologist (CTA) standards for the overall project. In order to conduct this work, an **RKEI** archaeologist stood on the edge of the active excavation, within a safe distance of heavy equipment, and observed the removal of soil matrix. Artifacts noted in the back dirt were inspected and collected if they were temporally diagnostic. If, during monitoring, clusters of artifacts were exposed, excavations were temporarily suspended in the area to allow for careful inspection of the feature. As a result, two archaeological features were recorded during cultural monitoring investigations; however, no intact cultural deposits were observed in association with the feature, nor were any intact cultural deposits observed throughout the duration of the project.

At the request of the CPSE Archaeologist, **RKEI** planned to systematically screen soil samples associated with intact Holocene-age deposits throughout the APE. Specifically, two to three shovel-scoops of soil from trenching excavations were to be screened through ¼-inch hardware cloth and examined for small pieces of cultural materials (e.g. debitage, fire-cracked rock, etc.). Screen samples were to be taken every 30 m in 20 to 30 cm levels. No screening samples were to be taken from disturbed deposits, or deposits that predated the Holocene Period. However, no intact soil deposits were observed within the APE, thus no screening samples were conducted.

The project adhered to a temporally diagnostic artifact collection only policy. As a result, no artifacts were collected during the course of the investigations, and no artifacts will be curated at the completion of the project. The only materials to be processed and curated consist of documents and digital photographs produced during field investigations. Digital photographs were printed on acid-free paper, labeled with archival-quality materials, and placed in archival-quality plastic sleeves. Ink-jet produced maps and illustrations were placed in archival quality plastic page protectors to prevent against accidental smearing due to moisture. Field notes, field forms, photographs, and field drawings were placed into labeled archival folders and were also converted into electronic files (i.e., pdf). A copy of the report and all digital material were burned onto a CD and permanently curated with field notes and documents. All field records generated by this project will be permanently curated at the CAR UTSA.

CHAPTER 5. RESULTS OF INVESTIGATIONS

RKEI conducted cultural resources monitoring investigations for the Broadway-Jones Gas Main Replacement Project on February 7-8, 19-23, and 25, 2019. Rhiana D. Ward served as Principal Investigator and Project Manager for the duration of the project, and all field work was conducted by Project Archaeologist Chris Matthews. Overall, the APE was found to be highly impacted from utility and construction disturbance with two historic features being recorded (**Figure 5-1**).

The Broadway-Jones Gas Main Replacement Project was located within the 10th Street and Avenue B ROWs, in a highly developed urban setting of downtown San Antonio, Texas. Each ROW consisted of an asphalt-paved city street flanked with concrete sidewalks and commercial development (**Figures 5-2 and Figure 5-3**). The APE alignment within in the 10th Street ROW was situated along the northeastern side of the street ROW, and the Avenue B alignment paralleled the southeastern curb of the ROW.

Excavations began within the 10th Street ROW, 180 feet (55 m) northwest of its intersection with Broadway Street. Initial trenching excavations uncovered a concrete utility duct bank directly under the asphalt, along with mottled brown (10YR 5/3) and yellowish-brown (10YR 5/4) silty clays with 10-percent gravel inclusions (**Figure 5-4**). Due to the presence of the unexpected duct bank, excavations were shifted slightly to the southwest, and continued northwest for 180 feet (55 m) towards the 10th Street–Avenue B intersection. Excavations ranged from 14 to 16 inches (36 to 41 cm) wide, and ranged from 45 to 47 inches (114 to 119 cm) below surface (**Figure 5-5**).

The average soil profile of trench excavations consisted of asphalt from 0 to 4 inches (0 to 10 cm) underlain with light yellowish-brown (10YR 6/4) silty loam with over 50-percent gravels and cobble inclusions. The silty loam – cobble matrix appeared to be a fill material that spanned the entire trench profile, from 4 to 47 inches (10 to 119 cm) below surface (**Figure 5-6**). At least four utilities intersected the 10th Street portion of the APE, at depths that ranged from 12 to 28 inches (30 to 71 cm) below surface (**Figures 5-7 and 5-8**). Cultural materials observed included orange brick fragments and three fragments of large mammal bone, one of which was machine cut based on the uniform cut patterns consistent with a mechanical saw (**Figures 5-9 and 5-10**). Cultural materials were observed sporadically throughout the trench alignment, but appeared to be isolated to pockets of dark brown (10YR 3/3) sandy clay. The sandy clay pockets were mixed within the light yellowish-brown silty loam fill matrix that dominated the trench excavations, but were typically located in the areas surrounding the four existing utilities observed.

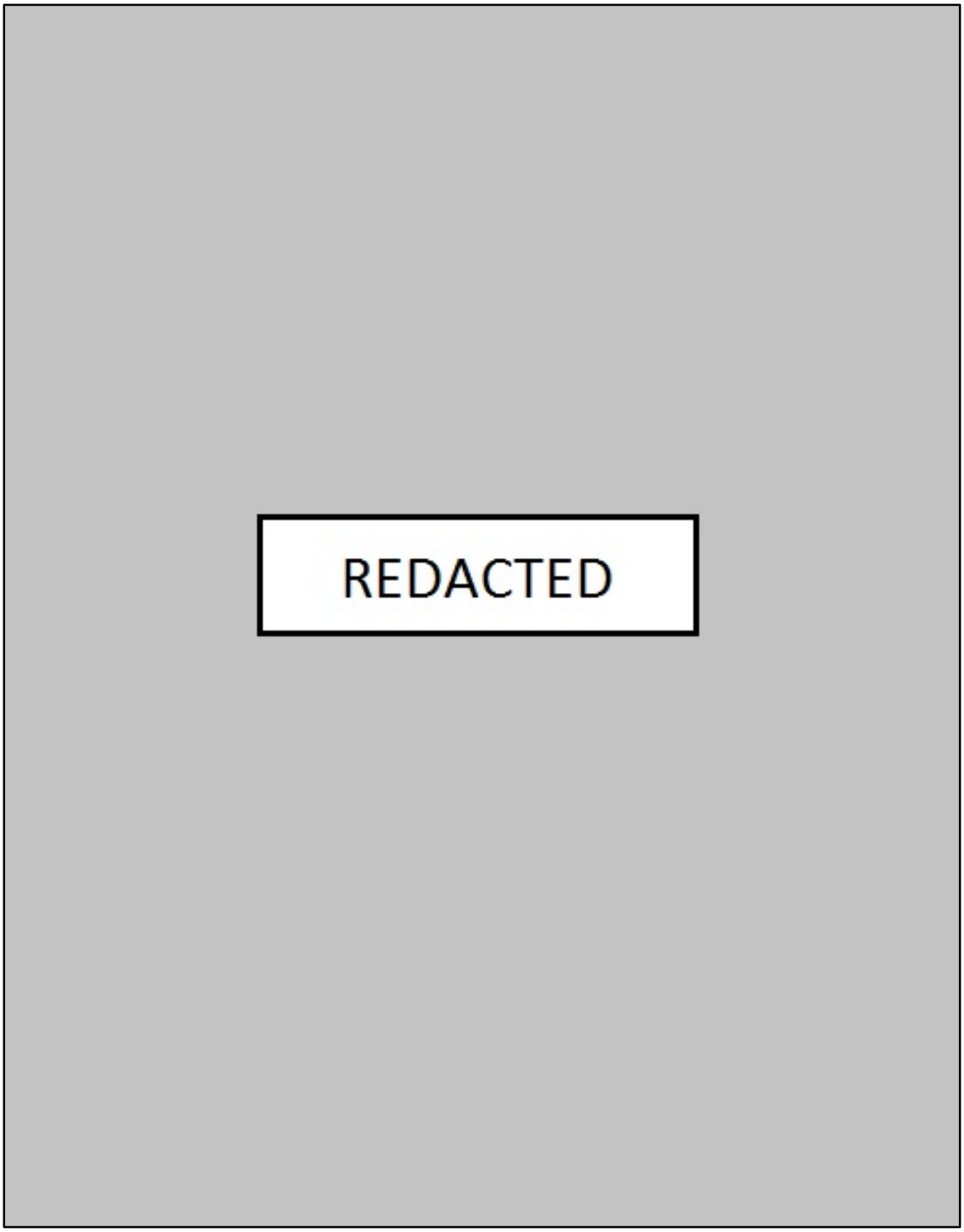

Figure 5-1. Cultural resources monitoring results.

Figure 5-2. Overview of APE along Avenue B, facing northeast.

Figure 5-3. Overview of APE along 10th Street, facing east.

Figure 5-4. Concrete duct bank in 10th Street at start of excavation, facing southeast.

Figure 5-5. Showing mottled soils and existing utilities in the trench, facing southeast.

Figure 5-6. Fill material present in the trench walls, facing northeast.

Figure 5-7. Utility intersecting the trench, facing northwest.

Figure 5-8. Abandoned utility intersecting the trench, facing northwest.

Figure 5-9. Example of orange brick fragments observed in the trench and spoil.

Figure 5-10. Three pieces of large mammal bone recovered from the trench spoil.

A pit was excavated at the intersection of 10th Street and Avenue B, at the northwestern terminus of the 10th Street alignment (**Figure 5-11**). The pit was excavated to expose existing utilities to be tied into. The dimensions of the pit were 9.5 feet (3 m) long, 4.9 feet (1.5 m) wide, and 5.2 feet (1.6 m) deep. Directly under the asphalt was a layer of limestone rubble that extended 12 inches (30 cm) below surface. The rubble layer was underlain by dark brown (10YR 3/3) silty clays with over 10-percent cobbles and gravel inclusions that extended to the bottom of the pit (**Figure 5-12**). At approximately 32 inches (81 cm) below surface, a ceramic pipe, possibly a sewer pipe, intersected the southern corner of the pit in a north/ south orientation (**Figure 5-13**). An existing gas line oriented east/west also intersected the pit at approximately 56 inches (142 cm) below surface. Also oriented east/west was a cast iron pipe in the pit at approximately 62 inches (157 cm) below surface (**Figure 5-14**). All soils within the pit excavations were observed to be heavily impacted from utility installation with no intact features or cultural deposits observed.

Figure 5-11. Excavation of pit at intersection of 10th Street and Avenue B, facing northwest.

Figure 5-12. Showing soils encountered in the pit, facing southeast.

Figure 5-13. Showing ceramic pipe and utilities exposed in the pit, facing southeast.

Figure 5-14. Showing exposed utilities in the pit, facing west.

Linear trench excavations for the APE continued within the Avenue B ROW, beginning at the pit and extending to the northeast (**Figure 5-15**). The dimensions of the Avenue B trench measured 450 feet (137 m) long, 16 inches (41 cm) wide, and 49 inches (124 cm) deep. The average soil profile consisted of: asphalt from 0 to 4 inches (0 to 10 cm) below surface; brown (10YR 4/3) silty clay mottled with light yellowish-brown (10YR 6/4) silty loam with over 50-percent gravel inclusions from 4 to 35 inches (10 to 89 cm) below surface; and brownish-yellow (10YR 6/6) silty clay from 35 to 49 inches (89 to 124 cm) below surface (**Figure 5-16**).

Figure 5-15. Trenching in Avenue B, facing northeast.

Approximately 20 existing utilities were recorded as intersecting the Avenue B trench. Utilities ranged from 16 to 41 inches (40 to 105 cm) below surface (**Figure 5-17**). Additional disturbances observed included sections of exposed concrete conduit that extended along the southeastern profile of the trench wall for approximately 204 feet (62 m) (**Figures 5-18**). The conduit extended from 4 to 28 inches (10 to 71 cm) below surface, and was underlain with brown silty clay mottled with light yellowish-brown (10YR 6/4) silty loam with over 50-percent gravel inclusions. The conduit appears to have paralleled the APE, though not all of its vertical surface was exposed by trenching. Small amounts of orange brick and tile fragments were observed throughout the trench excavations (**Figures 5-19 and 5-20**), though no intact

Figure 5-16. Showing average soil profile within the Avenue B ROW, facing northwest.

Figure 5-17. Showing utilities intersecting the trench, facing southwest.

Figure 5-18. Showing concrete conduit in the eastern trench wall, facing east.

Figure 5-19. Example of orange tile fragments from Avenue B excavations.

Figure 5-20. Example of orange brick fragments from Avenue B excavations.

cultural deposits were observed. Although a majority of the APE had been heavily disturbed, two intact features were documented at the northeastern end of the APE and recorded as archaeological sites 41BX2308 and 41BX2309.

Feature 1 – 41BX2308

A limestone feature was exposed in the Avenue B trench, approximately 286 feet (87 m) northeast of the 10th Street – Avenue B intersection. The feature was constructed of multiple articulated, rough cut stones with no visible mortar present. The alignment ranged from 38 to 43 inches (97 to 109 cm) below surface, measured 13 inches (33 cm) wide, and extend into the southeastern and northwestern trench profile walls (**Figures 5-21 and 5-22**). Soils immediately adjacent to the feature changed from a highly disturbed matrix to a very dark grayish-brown (10YR 3/2) sandy clay loam with over 20-percent gravel inclusions that extended to the trench floor at 43 inches (109 cm) below surface (**Figure 5-23**). The feature appeared to be in situ; however, based on the level of disturbance in the immediate vicinity of the feature, it is possible that the upper levels or tiers of limestone material may have been impacted by previous construction activities. No cultural materials were observed in association with Feature 1.

Figure 5-21. Showing Feature 1– 41BX2308 in the floor of the trench, facing southeast.

Figure 5-22. Closer view of Feature 1 – 41BX2308, facing southeast.

Figure 5-23. Soil stratigraphy associated with Feature 1 – 41BX2308, facing northwest.

A review of Sanborn Fire Insurance maps did not identify any buildings or structures within or immediately adjacent to the location of Feature 1. However, review of a restricted 1852 overlay map provided by the COSA OHP depicts a possible lateral of the *Acequia Madre* as intersecting the APE approximately 20 feet (6 m) southwest of Feature 1 (**Figure 5-24**). However, the small section of exposed alignment does not provide enough supporting evidence to definitively associate the feature to the projected lateral ditch. Furthermore, although the limestone material and rough cut construction of the stones suggests an early construction, no cultural materials were observed that would support a temporal range for the feature.

Feature 2 – 41BX2309

Feature 2 was located approximately 4.9 feet (1.5 m) southwest of the northeastern Avenue B trench terminus (**Figures 5-25 and 5-26**). The feature consisted of two metal I-beam rails that measured 4 inches (10 cm) tall, 2.5 inches (6.5 cm) wide, and 0.39 inches (1 cm) thick. The distance between each rail was 46 inches (116 cm) with the orientation of the rails being roughly northwest to southeast. The tops of the rails were at a depth of 28 inches (71 cm) below surface and appeared to be set on top of an aggregate concrete slab. The slab was present from 32 inches (81 cm) below surface, and extended beyond the trench floor at 47 inches (119 cm) below surface. The feature extended approximately 12 inches (30 cm)

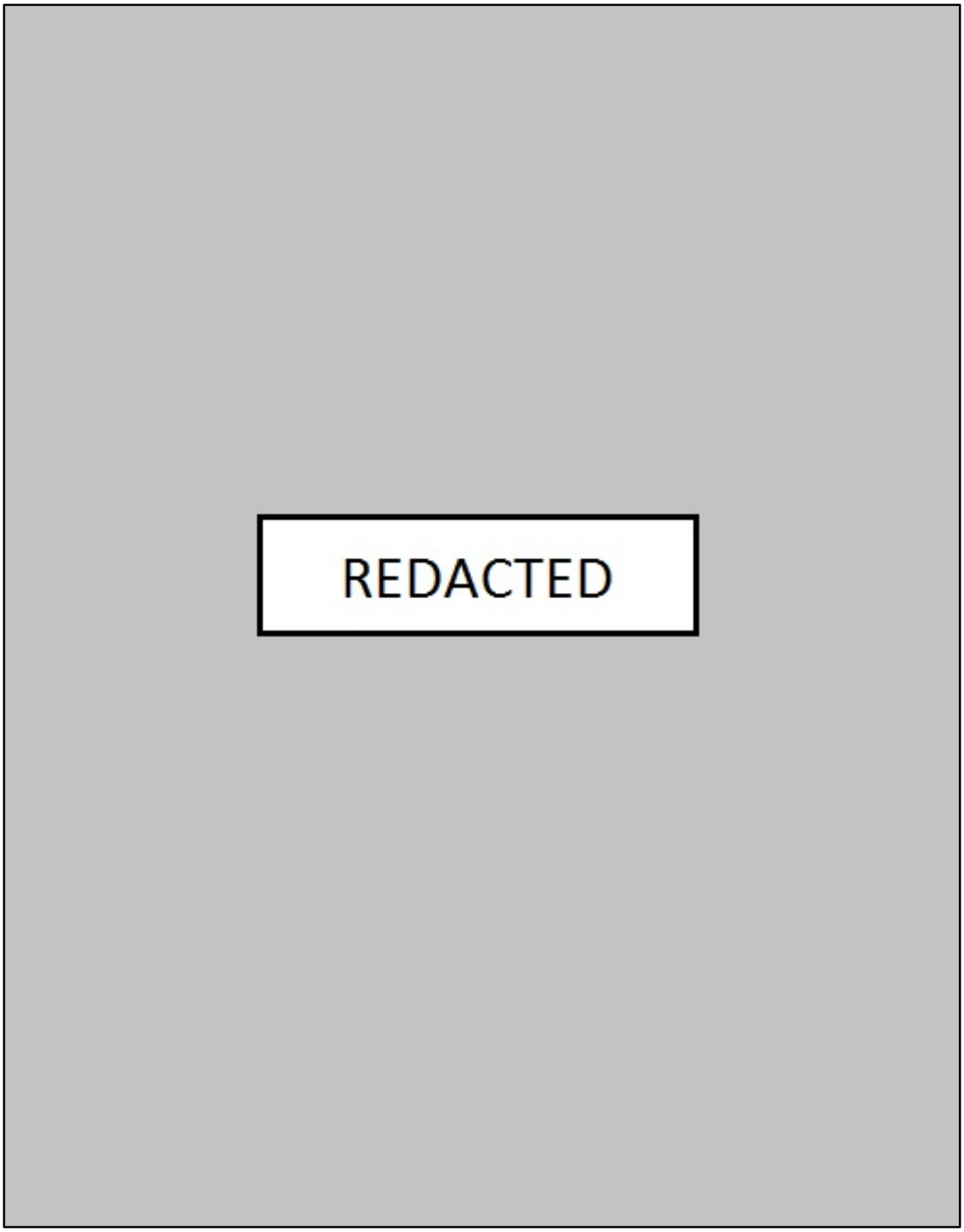

Figure 5-24. 1852 overlay map provided by the COSA OHP showing projection of the *Acequia Madre* lateral within the APE.

Figure 5-25. Showing Feature 2 in the western trench wall, facing northwest.

Figure 5-26. Overview of Feature 2, facing southwest.

into the excavated trench from the northwestern wall. No evidence of the feature was observed within the southeastern trench profile wall. The rails and concrete appear to have been previously cut, which was most likely due to the placement of previous utilities. No cultural materials were observed in association with Feature 2.

An additional, separate layer of angular aggregate concrete capped the rail and lower concrete slab of Feature 2. The concrete cap ranged from a depth of 24 to 32 inches (61 to 82 cm) below surface. A void was present in the aggregate concrete between the two rails, though nothing was visible inside the void (**Figure 5-27**). The aggregate concrete cap was likely poured in place after the abandonment of the rail system.

Figure 5-27. Showing the void in the aggregate concrete, facing northwest.

A review of the 1924-1970 Trolley Map depicts Feature 2 as within the alignment of the Texas Transportation Company Railroad (**Figure 5-28**). The privately owned railroad was established in 1887 as a short line for the Pearl Brewing Company, located 0.27 mile (0.4 km) north-northwest of the APE (Hemphill 2006). The rail line consisted of approximately 1.3 miles (2.1 km) of track which spurred from the Galveston, Harrisburg and San Antonio Railroad (Southern Pacific System) near its intersection with

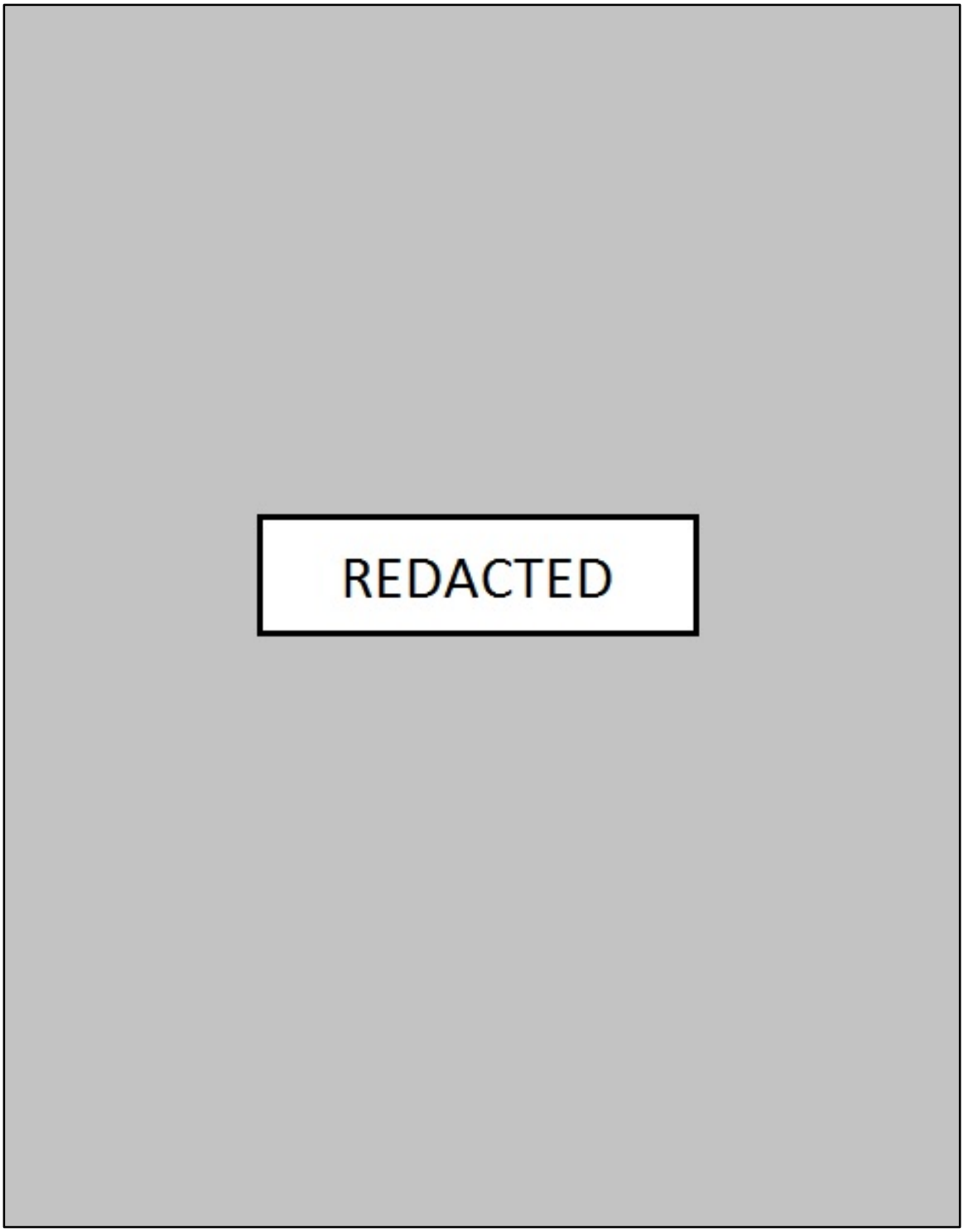

Figure 5-28. Showing the APE and the location of 41BX2309 on 1924-1970 Trolley Map of San Antonio.

Burleson Street. The short line railroad directed northwest down the Jones Avenue ROW and redirected northeast just before the Jones Avenue – Camden Street intersection. The line then projected across the San Antonio River and terminated within the Pearl Brewery facility. The Pearl Brewery closed its doors in 2001, and by 2003 the Texas Transportation Company Railroad had been decommissioned and dismantled (Hemphill 2006, Werner 2019). Feature 2, recorded as archaeological site 41BX2309, likely represents a remnant of the 1887 Transportation Company Railroad alignment, decommissioned and capped with the angular concrete in the early 2000s.

Unmonitored Construction

Excavations for a lateral service line that extended across Avenue B were not monitored for cultural resources due a lack of notification from construction crews to **RKEI** archaeologists (see **Figure 5-1**). The service connection was approximately 190 feet (58 m) south of the Avenue B – Jones Street intersection and extended to the northwestern side of Avenue B (**Figure 5-29**). The length of the lateral was approximately 28.8 feet (8.8 m) long and measured 1.3 feet (40 cm) wide. The purpose of the trench was to replace an existing service line and was likely located within a previously disturbed trench. The CPSE Archaeologist was notified of the unmonitored excavations via email shortly after **RKEI** had identified the unmonitored trench. The trench was excavated and filled with flowable concrete at an unknown date. As such, no spoils or profile walls were available for inspection by an **RKEI** archaeologists.

Figure 5-29. Showing lateral crossing Avenue B, facing southwest.

CHAPTER 6. SUMMARY AND RECOMMENDATIONS

RKEI was contracted by CPSE to conduct cultural resources investigations for the CPSE Broadway-Jones Gas Main Replacement Project in southern San Antonio, Bexar County, Texas. The project involved the excavation of a 630 foot (192 m) trench for the relocation of a gas main within the 10th Street and Avenue B ROWs. A cultural resources review conducted by the CPSE Archaeologist determined that the project was located within a culturally rich setting that had the potential to encounter both historic and prehistoric cultural resources. Specifically, the project had the potential to encounter a possible *desague*, or lateral, of the *Acequia Madre,* as illustrated on an 1852 Map identified by the COSA OHP. Furthermore, close proximity to the San Antonio River, located 150 feet (46 m) to the northwest, increased the probability of encountering prehistoric cultural deposits. Base on this information, the CPSE Archaeologist determined that cultural resources monitoring would be required for all 630 feet (192 m) of excavations associated with the project.

Cultural resources monitoring investigations for the Broadway-Jones Gas Main Replacement Project were conducted on February 7-8, 19-23, and 25, 2019. Monitoring investigations identified 20 existing utility lines, which had heavily impacted a majority of the APE. Disturbed soils were observed throughout all of the 10th Street ROW, as well as a majority of the Avenue B ROW. However, two features were recorded the northeastern end of the APE, where an approximate 13 foot (4 m) section of intact soil was present. No intact deposits of cultural materials were observed.

Feature 1, recorded as archaeological site 41BX2308, was a limestone feature exposed in the Avenue B trench, approximately 286 feet (87 m) northeast of the 10th Street – Avenue B intersection. The feature was constructed of multiple articulated, rough cut stones with no visible mortar present. The alignment ranged from 38 to 43 inches (97 to 109 cm) below surface, measured 13 inches (33 cm) wide, and extends into the southeastern and northwestern trench profile walls. The feature appeared to be in situ; however, based on the level of disturbance in the immediate vicinity of the feature, it is possible that the upper levels or tiers of limestone material may have been impacted by previous construction activities. A review of a restricted 1852 overlay map provided by the COSA OHP depicts a lateral of the *Acequia Madre* as intersecting the APE, approximately 20 feet (6 m) southwest of Feature 1. It is possible that Feature 1 represents the remnants of the possible *desague*, however, the small section of exposed alignment does not provide enough supporting evidence to definitively associate the feature to the projected lateral ditch.

Furthermore, although the limestone material and rough cut construction of the stones suggests an early construction, no cultural materials were observed that would support a temporal range for the feature.

Feature 2, recorded as archaeological site 41BX2309, likely represents a remnant of the 1887 Texas Transportation Company Railroad. The feature consisted of two metal I-beam rails that measured 4 inches (10 cm) tall, 2.5 inches (6.5 cm) wide, and 0.39 inches (1 cm) thick. The tops of the rails were at a depth of 28 inches (71 cm) below surface and appeared to be set on top of an aggregate concrete slab, which ranged from 32 inches (81 cm) below surface and extended beyond the limits of the trenching excavation (47 inches [119 cm] below surface). An additional, separate layer of angular aggregate concrete capped the rail and lower concrete slab of Feature 2. The concrete cap ranged from a depth of 24 to 32 inches (61 to 82 cm) below surface, and likely represents the dismantling of the Texas Transportation Company Railroad in the early 2000s.

RKEI made a reasonable and good faith effort to identify cultural resources within the given APE. As such, **RKEI** recommends no further archaeological investigations for the current APE. However, should additions be made to the APE, additional cultural resources investigations may be required. Furthermore, additional work may be warranted for any future ground disturbing activities within the vicinity of 41BX2308 in order to determine the horizontal extent of the feature, and to provide additional information as to the function and temporal affiliation of the site. Based on the current investigations, **RKEI** recommends site 41BX2308 as eligibility undetermined for designation as an NRHP or State Antiquities Landmark (SAL).

No further work is recommended for site 41BX2309. Site 41BX209 likely represents a remnant of the 1887 Texas Transportation Company Railroad. Other than the projection of the rail bed alignment, the decommissioned tract has a low research value and provides minimal information to the historical knowledge of the area. **RKEI** recommends site 41BX2309 as not eligible for designation to the NRHP or as a SAL.

REFERENCES CITED

Barnes, V.E.

1983 *Geologic Atlas of Texas, San Antonio Sheet.* Bureau of Economic Geology, The University of Texas at Austin.

Bement, L.C

1991 The Thunder Valley Burial Cache: Group Investment in a Central Texas Sinkhole Cemetery. *Plains Anthropologist* 36(135):97-109

Black, S.L.

1989 Central Texas Plateau Prairie. In *From the Gulf Coast to the Rio Grande: Human Adaptations in Central, South, and Lower Pecos Texas*, by T.R. Hester, S.L. Black, D.G. Steele, B.W. Olive, A.A. Fox, K.J. Reinhard, and L.C. Bement, pp. 17-38. Research Series No. 33. Arkansas Archaeological Survey, Fayetteville.

Black, S.L., and D.G. Creel

1997 *The Central Texas Burned Rock Midden Reconsidered*. In Hot Rock Cooking on the Greater Edwards Plateau: Four Burned Rock Midden Sites in West Central Texas, by Steve Black, Linda W. Ellis, Darrell G. Creel and Glenn T. Goode, pp.269-305. Studies in Archeology 2. Texas Archeological Research Laboratory, The University of Texas at Austin.

Blair, W.F.

1950 The Biotic Provinces of Texas. *Texas Journal of Science* 2(1):93-117.

Bousman, C.B, B.W. Baker, and A.C. Kerr

1998 Paleoenvironmental Change in Central Texas: The Palynological Evidence. *Plains Anthropologist* 43 (164):201-219.

2004 Paleoindian Archeology in Texas. In *The Prehistory of Texas*, edited by Timothy Perttula, pp. 15-97. Texas A&M University Press, College Station.

Collins, M.B.

1995 Forty Years of Archeology in Texas. *Bulletin of the Texas Archeological Society* 66:361-400.

2004 Archeology in Central Texas. In *Prehistory of Texas*, edited by T.K. Perttula, pp. 101-126. Texas A&M University Press, College Station.

Collins, M.B., J. Guy, and S.W. Dial

1998 The Archaic Period, 8800 to 1300 BP. In Wilson-Leonard: An 11,000-year Archaeological Record of Hunter-Gatherers on Central Texas. Volume I: Introduction, Background, and Syntheses, edited by Michael B. Collins, pp. 211-270. Studies in Archaeology 31. Texas Archaeological Research Laboratory, The University of Texas at Austin.

Collins, M.B., D.B. Hudler, and S.L. Black

2003 *Pavo Real (41BX52): A Paleoindian and Archaic Camp and Workshop on the Balcones Escarpment, South-Central, Texas*. Studies in Archeology 41, Texas Archeological Research Laboratory, The University of Texas at Austin. Archeological Studies Program, Report 50, Environmental Affairs Division, Texas Department of Transportation, Austin.

Cox, I. W.

2005 *Spanish Acequias of San Antonio.* Maverick Publishing Company, San Antonio.

Cox, I. W., E.D. Johnson, and C.B. Bousman

1999 *Excavations for the Upper Labor Dam Site, Brackenridge Park, San Antonio, Bexar County, Texas.* Archaeological Survey Report, No. 268. Center for Archaeological Research at the University of Texas at San Antonio, San Antonio.

Ferring, C.R.

2001 *The Archaeology and Paleoecology of the Aubrey Clovis Site (41DN479) Denton County, Texas*. Center for Environmental Archaeology. Department of Geology, University of North Texas, Denton.

Fox, Anne A.

1979 *A Survey of Archaeological, Architectural, and Historical Sites on the San Antonio River from Olmos Dam to South Alamo Street and on San Pedro Creek from San Pedro Park to Guadalupe Street.* Archaeological Survey Report No. 80. Center for Archaeological Research, The University of Texas, San Antonio.

Fox, A.A., and D.E. Fox

1967 The Classen Rock Shelter, 41BX23. Manuscript on File at the Center for Archaeological Research, The University of Texas at San Antonio.

Habig, M.A.

1968 The Alamo Chain of Missions: A History of San Antonio's Five Missions. Franciscan Herald Press, Chicago.

Hester, T.R.

1978 Early Human Occupation in South Central and Southwestern Texas; Preliminary Papers on the Baker Cave and St. Mary's Hall Sites. Manuscript on File. Center for Archaeological Research, The University of Texas at San Antonio.

1990 Plainview Artifacts at the St. Mary's Hall Site, South Central Texas. *Current Research in the Pleistocene* 7:14-17.

Hemphill, H.

2006 The Railroads of San Antonio and South Central Texas. Maverick Publishing Company, San Antonio.

Highley, C.L., C. Graves, C. Land, and G. Judson

1978 Archeological Investigations at Scorpion Cave (41ME7) Medina County, Texas. *Bulletin of the Texas Archeological Society* 49:139-194.

Huebner, J.A.
1991 Late Prehistoric Bison Populations in Central and Southern Texas. *Plains Anthropologist*. 36(137):343-358.

Ivey, J.E.
1984 The San Antonio Missions. Unpublished manuscript on file at the Center for Archaeological Research, The University of Texas at San Antonio.

Johnson, L.
1994 The Life and Times of Toyah-Culture Folk: The Buckhollow Encampment Site 41KM16, Kimble County, Texas. Report No. 38. Office of the State Archeologist, Austin.

Johnson, L., and G.T. Goode
1994 A New Try at Dating and Characterizing Holocene Climates, as well as Archaeological Periods, on Eastern Edwards Plateau. *Bulletin of the Texas Archaeological Society* 65:1-51.

Kalter, A.J., R.M. Rogers, and M.N. Smith
2005 *Analysis and Reporting for 41FY135, the Sandbur Site, Fayette County, Texas*. PBS&J, Document No. 020388. Archeological Studies Program Report No. 73. Texas Department of Transportation, Austin.

Mauldin, R.P., and D.L. Nickels
2001 *An Archeological Survey of Twin Buttes Reservoir, Tom Green County, Texas.* Archeological Survey Report, No. 300, Center for Archeological Research, The University of Texas at San Antonio.

Mauldin, R.P., D.L. Nickels, and C.J. Broehm
2003 Archaeological Testing at Determine the National Register Eligibility Status of 18 Prehistoric Sites on Camp Bowie, Brown County, Texas (Volume 1 and Volume 2). Archaeological Survey Report, No. 334. Center for Archaeological Research, The University of Texas at San Antonio.

Meltzer, D.J., and M.R. Bever
1995 Paleoindians of Texas: An Update on the Texas Clovis Fluted Point Survey. *Bulletin of the Texas Archeological Society* 66:47-81.

Natural Resources Conservation Service (NRCS)
2019 Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. *Soil Survey of Karnes County, Texas*. Available at http://websoilsurvey.nrcs.usda.gov/. Accessed January 2019.

Nickels, D.L., C.B. Bousman, J.D. Leach, and D.A. Cargill
1998 *Test Excavations at the Culebra Creek Site, 41BX126, Bexar County, Texas*. Archaeological Survey Report, No. 265. Center for Archaeological Research, The University of Texas at San Antonio.

Owens, J. D. and K. St. Clair
2018 *Archeological Investigations on the 3.3-acre Broadway Jones Tract, San Antonio, Bexar County, Texas.* Report No. H222-180075. Horizon Environmental Services, Inc., Austin.

Patterson, L.W.
1988 Chronology of Arrow Point Types in South Texas. *La Tierra* 15(4):29-33.

Porter, C. R.
2009 Spanish Water, Anglo Water: Early Development in San Antonio. Texas A&M University Press, College Station.

Powell, J.F., and D.G. Steele
1994 Diet and Health of Paleoindians: An Examination of Early Holocene Human Dental Remains. In *Paleonutrition: The Diet and Health of Prehistoric American*, edited by K.D. Sobolik, pp. 176-192. Occasional Paper No. 22. Carbondale: Center for Archaeological Investigations, Southern Illinois University, Carbondale.

Prewitt, E.R.
1981 Cultural Chronology in Central Texas. *Bulletin of the Texas Archaeological Society*. 52:65-89.

Quigg, J.M., C. Lintz, F.M. Oglesby, A.C. Earls, C.D. Frederick, W.N. Trierweiler, D. Owsley, and K.W. Kibler
1993 Historic and Prehistoric Data Recovery at Palo Duro Reservoir, Hansford County, Texas. Technical Report 485. Mariah Associates, Inc., Austin.

Ricklis, R.A.
1995 Prehistoric Occupation of the Central and Lower Texas Coast: A Regional Overview. Bulletin of the Texas Archeological Society 66:265-300.

Schuetz, M.K.
1968 The History and Archaeology of Mission San Juan Capistrano, San Antonio, Texas. Volume 1. Archeological Program Report Number 10. State Building Commission, Austin.

Scurlock, D., A. Benavides, Jr., D. Isham, and J.W. Clark, Jr.
1976 An Archeological and Historical Survey of the Proposed Mission Parkway, San Antonio, Texas. Office of the State Archeologist, Texas Historical Commission, Austin.

Skinner, S.A.
1981 Aboriginal Demographic Changes in Central Texas. *Plains Anthropologist* 26(92):111-118.

Southern Regional Climate Center (SRCC)
2019 http://www.srcc.lsu.edu/. Accessed January 2019.

Story, D.A.
1985 Adaptive Strategies of Archaic Cultures of the West Gulf Coastal Plain. In *Prehistoric Food Productions in North America*, edited by R.I. Ford, pp. 19-56. Anthropological Papers No. 75. Museum of Anthropology, University of Michigan, Ann Arbor.

Teja, J. de la
1995 San Antonio de Béjar: A Community on New Spain's Northern Frontier. University of New Mexico, Albuquerque.

Thoms, A.V. D.D. Keuhn, B.W. Olive, J.E. Dockall, P.A. Clabaugh an R.D. Mandel
1996 Early and Middle Holocene Occupations at the Richard Beene Site: the 1995 Southern Texas Archaeological Society Association Field School Project. *La Tierra* (23) 4:1-36.

Thoms, A.V., and R.D. Mandel
2006 *Archaeological and Paleoecological Investigations at the Richard Beene Site 41BX831: South Central Texas.* Reports of Investigations, No. 8. Center for Ecological Archaeology, Texas A&M University, College Station.

Texas Historical Commission (THC)
2019 Texas Archaeological Sites Atlas. Online Resource. http://nueces.thc.state.tx.us/. Accessed January 2019.

Tomka, S.A.
2012 Playing with Mud and Sticks. Experimental *Jacal* Building on the San Antonio River. Paper presented at the 83rd Annual Meeting of the Texas Archeological Society, Tyler, Texas.

Toomey, R.S., M.D. Blum, and S. Valastro, Jr.
1993 Late Quaternary Climates and Environments of the Edwards Plateau, Texas. *Global and Planetary Change* 7:299-320.

Ward, R. D.
2015 *Cultural Resources Monitoring Investigations for the Jones Avenue Pole Replacement Project, Downtown San Antonio, Bexar County Texas.* SWCA Cultural Resources Report No. 15-158. SWCA Environmental Consultants, San Antonio.

Werner, G.C.
2019 Texas Transportation Company, *Handbook of Texas Online*. https://tshaonline.org/handbook/online/articles/eqt17. Accessed May 22, 2019.

Winkler, B.A.
1982 Wild Plant Foods of the Desert Gatherers of West Texas, New Mexico, and Northern Mexico: Some Nutritional Values. Unpublished Master's Thesis, Department of Anthropology. The University of Texas at Austin.